

#11



1600

RAW SEQUENCE LISTING

DATE: 04/02/2003

PATENT APPLICATION: US/09/895,435A

TIME: 12:20:35

Input Set : E:\9882012999.txt

Output Set: N:\CRF4\04022003\I895435A.raw

3 <110> APPLICANT: Stewart, A. F.
 4 Zhang, Y.
 5 Hallet, B.
 7 <120> TITLE OF INVENTION: A New Tyrosine Recombinase for Genetic Engineering
 9 <130> FILE REFERENCE: 9882-012-999
 11 <140> CURRENT APPLICATION NUMBER: 09/895,435A
 12 <141> CURRENT FILING DATE: 2001-06-30
 14 <160> NUMBER OF SEQ ID NOS: 10
 16 <170> SOFTWARE: PatentIn version 3.0
 18 <210> SEQ ID NO: 1
 19 <211> LENGTH: 244
 20 <212> TYPE: DNA
 21 <213> ORGANISM: Bacillus thuringiensis
 23 <400> SEQUENCE: 1
 24 ggtaccgcca gcatttcgga aaaaaaccac gctaagaaaa tcagagttaa aaaatcagaa 60
 25 aatatatcat tattccttga cacatacatg ttcttttttt atacaaaaaa taatacaaca 120
 26 caatattaat tgtgtttgtat taggtgttat aataaatata aatctagggg tttaacgcaa 180
 27 cacaatttat cgataaataa atacttttag acgcaacaca atttatagac gcggaggaaa 240
 28 tcac 244
 30 <210> SEQ ID NO: 2
 31 <211> LENGTH: 118
 32 <212> TYPE: DNA
 33 <213> ORGANISM: Bacillus thuringiensis
 35 <400> SEQUENCE: 2
 36 taatacaaca caatattaat tgtgtttgtat taggtgttat aataaatata aatctagggg 60
 37 tttaacgcaa cacaatttat cgataaataa atacttttag acgcaacaca atttatag 118
 39 <210> SEQ ID NO: 3
 40 <211> LENGTH: 32
 41 <212> TYPE: DNA
 42 <213> ORGANISM: Bacillus thuringiensis
 44 <400> SEQUENCE: 3
 45 taatacaaca caatattaat tgtgtttgtat ta 32
 47 <210> SEQ ID NO: 4
 48 <211> LENGTH: 249
 49 <212> TYPE: DNA
 50 <213> ORGANISM: Bacillus thuringiensis
 52 <400> SEQUENCE: 4
 53 ggggtaccgc cagcatttcg gaaaaaacc acgctaagaa aatcagagtt aaaaaatcag 60
 54 aaaatatatc attattcctt gacacatata tggtcttttt ttatacaaaa aataatacaa 120
 55 cacaatatta attgtgttgt attaggtgtt ataataaata taaatctagg gggttaacgc 180
 56 aacacaattt atcgataaat aaatactttt agacgcaaca caatttatag acgcggagga 240
 57 aatcacatg 249
 59 <210> SEQ ID NO: 5

ENTERED

RAW SEQUENCE LISTING

DATE: 04/02/2003

PATENT APPLICATION: US/09/895,435A

TIME: 12:20:35

Input Set : E:\9882012999.txt

Output Set: N:\CRF4\04022003\I895435A.raw

```

60 <211> LENGTH: 798
61 <212> TYPE: DNA
62 <213> ORGANISM: Bacillus thuringiensis
64 <220> FEATURE:
65 <221> NAME/KEY: CDS
66 <222> LOCATION: (1)..(798)
68 <400> SEQUENCE: 5
69 atg gat gtt gca aaa cag ttt tct tct tat ctt aaa caa gag aat aaa      48
70 Met Asp Val Ala Lys Gln Phe Ser Ser Tyr Leu Lys Gln Glu Asn Lys
71 1          5          10          15
72 acc gag aac act gtt cag gga tac aca tca ggt att aga cag tac ata      96
73 Thr Glu Asn Thr Val Gln Gly Tyr Thr Ser Gly Ile Arg Gln Tyr Ile
74          20          25          30
75 aaa tgg ttt gaa ggt tcc tat gac aga aaa ttg aca aaa ttg tac cga      144
76 Lys Trp Phe Glu Gly Ser Tyr Asp Arg Lys Leu Thr Lys Leu Tyr Arg
77          35          40          45
78 caa aat atc tta gag tac att agt tat tta aag aat gtc aaa atg ttg      192
79 Gln Asn Ile Leu Glu Tyr Ile Ser Tyr Leu Lys Asn Val Lys Met Leu
80          50          55          60
81 aac gcc aag tcc att aac cac aag att agt agc ctt gct aaa ttt aat      240
82 Asn Ala Lys Ser Ile Asn His Lys Ile Ser Ser Leu Ala Lys Phe Asn
83 65          70          75          80
84 gaa ttt cta ata cag aaa gga agt caa caa gat caa gta att tta tta      288
85 Glu Phe Leu Ile Gln Lys Gly Ser Gln Gln Asp Gln Val Ile Leu Leu
86          85          90          95
87 gat gta aaa aag ttt tta caa agt gtg tta gag gat aat aac aaa cgt      336
88 Asp Val Lys Lys Phe Leu Gln Ser Val Leu Glu Asp Asn Asn Lys Arg
89          100          105          110
90 aat tat gca att gcc act ctc cta gca tat aca gga gta cgt att tca      384
91 Asn Tyr Ala Ile Ala Thr Leu Leu Ala Tyr Thr Gly Val Arg Ile Ser
92          115          120          125
93 gag gca tta tct atc aaa atg aat gac ttc aat tta cag act ggg gaa      432
94 Glu Ala Leu Ser Ile Lys Met Asn Asp Phe Asn Leu Gln Thr Gly Glu
95          130          135          140
96 tgt att att cga agt gga aaa gga ggt aaa caa cga att gta tta cta      480
97 Cys Ile Ile Arg Ser Gly Lys Gly Gly Lys Gln Arg Ile Val Leu Leu
98 145          150          155          160
99 aat agt aag gta ctt agt gct atc aaa gat tat ctc atc gat cga aaa      528
100 Asn Ser Lys Val Leu Ser Ala Ile Lys Asp Tyr Leu Ile Asp Arg Lys
101          165          170          175
102 aca tac agt aca gca cat gaa tct ccg tat ctt ttt att agt aaa aag      576
103 Thr Tyr Ser Thr Ala His Glu Ser Pro Tyr Leu Phe Ile Ser Lys Lys
104          180          185          190
105 cga gaa aag ctc gac cgt acg gtc gtc aat cgt atc ttt aaa tca tac      624
106 Arg Glu Lys Leu Asp Arg Thr Val Val Asn Arg Ile Phe Lys Ser Tyr
107          195          200          205
108 agg aat gtt att act cca cac caa tta cga cac ttc ttc tgt acg aat      672
109 Arg Asn Val Ile Thr Pro His Gln Leu Arg His Phe Phe Cys Thr Asn
110          210          215          220

```

RAW SEQUENCE LISTING

DATE: 04/02/2003

PATENT APPLICATION: US/09/895,435A

TIME: 12:20:35

Input Set : E:\9882012999.txt

Output Set: N:\CRF4\04022003\I895435A.raw

```

111 gca att caa aaa gga ttt agc att cat gaa gtt gca aat caa gct ggg      720
112 Ala Ile Gln Lys Gly Phe Ser Ile His Glu Val Ala Asn Gln Ala Gly
113 225                230                235                240
114 cac tct aac atc cat acg aca cta ctt tac aca aat cca aac caa ctg      768
115 His Ser Asn Ile His Thr Thr Leu Leu Tyr Thr Asn Pro Asn Gln Leu
116                245                250                255
117 cag cta aaa aat aaa atg gag ctc tta taa      798
118 Gln Leu Lys Asn Lys Met Glu Leu Leu
119                260                265
121 <210> SEQ ID NO: 6
122 <211> LENGTH: 265
123 <212> TYPE: PRT
124 <213> ORGANISM: Bacillus thuringiensis
126 <400> SEQUENCE: 6
127 Met Asp Val Ala Lys Gln Phe Ser Ser Tyr Leu Lys Gln Glu Asn Lys
128 1                5                10                15
130 Thr Glu Asn Thr Val Gln Gly Tyr Thr Ser Gly Ile Arg Gln Tyr Ile
131                20                25                30
133 Lys Trp Phe Glu Gly Ser Tyr Asp Arg Lys Leu Thr Lys Leu Tyr Arg
134                35                40                45
136 Gln Asn Ile Leu Glu Tyr Ile Ser Tyr Leu Lys Asn Val Lys Met Leu
137                50                55                60
139 Asn Ala Lys Ser Ile Asn His Lys Ile Ser Ser Leu Ala Lys Phe Asn
140 65                70                75                80
142 Glu Phe Leu Ile Gln Lys Gly Ser Gln Gln Asp Gln Val Ile Leu Leu
143                85                90                95
145 Asp Val Lys Lys Phe Leu Gln Ser Val Leu Glu Asp Asn Asn Lys Arg
146                100                105                110
148 Asn Tyr Ala Ile Ala Thr Leu Leu Ala Tyr Thr Gly Val Arg Ile Ser
149                115                120                125
151 Glu Ala Leu Ser Ile Lys Met Asn Asp Phe Asn Leu Gln Thr Gly Glu
152                130                135                140
154 Cys Ile Ile Arg Ser Gly Lys Gly Gly Lys Gln Arg Ile Val Leu Leu
155 145                150                155                160
157 Asn Ser Lys Val Leu Ser Ala Ile Lys Asp Tyr Leu Ile Asp Arg Lys
158                165                170                175
160 Thr Tyr Ser Thr Ala His Glu Ser Pro Tyr Leu Phe Ile Ser Lys Lys
161                180                185                190
163 Arg Glu Lys Leu Asp Arg Thr Val Val Asn Arg Ile Phe Lys Ser Tyr
164                195                200                205
166 Arg Asn Val Ile Thr Pro His Gln Leu Arg His Phe Phe Cys Thr Asn
167                210                215                220
169 Ala Ile Gln Lys Gly Phe Ser Ile His Glu Val Ala Asn Gln Ala Gly
170 225                230                235                240
172 His Ser Asn Ile His Thr Thr Leu Leu Tyr Thr Asn Pro Asn Gln Leu
173                245                250                255
175 Gln Leu Lys Asn Lys Met Glu Leu Leu
176                260                265
178 <210> SEQ ID NO: 7

```

RAW SEQUENCE LISTING

DATE: 04/02/2003

PATENT APPLICATION: US/09/895,435A

TIME: 12:20:35

Input Set : E:\9882012999.txt

Output Set: N:\CRF4\04022003\I895435A.raw

```

179 <211> LENGTH: 116
180 <212> TYPE: DNA
181 <213> ORGANISM: Bacillus thuringiensis
183 <400> SEQUENCE: 7
184 taatacaaca caatattaat tgtgttgtat taggtgttat aataaatata tatctagggg      60
185 tttaacgcaa cacaatttat cgataaataa atacttttag acgcaacaca atttat      116
187 <210> SEQ ID NO: 8
188 <211> LENGTH: 116
189 <212> TYPE: DNA
190 <213> ORGANISM: Bacillus thuringiensis
192 <400> SEQUENCE: 8
193 taatacaaca caatattaat tgtgttgtat taggtgttat aatatatata aatctagggg      60
194 tttaacgcaa cacaatttat cgataaataa atacttttag acgcaacaca atttat      116
196 <210> SEQ ID NO: 9
197 <211> LENGTH: 116
198 <212> TYPE: DNA
199 <213> ORGANISM: Bacillus thuringiensis
201 <220> FEATURE:
202 <221> NAME/KEY: N_region
203 <222> LOCATION: 33 .. 64
204 <223> OTHER INFORMATION: n = a, t, g, or c
207 <220> FEATURE:
208 <221> NAME/KEY: N_region
209 <222> LOCATION: 81 .. 100
210 <223> OTHER INFORMATION: n = a, t, g, or c
212 <400> SEQUENCE: 9
W--> 213 taatacaaca caatattaat tgtgttgtat tannnnnnnn nnnnnnnnnn nnnnnnnnnn      60
214 nnnnacgcaa cacaatttat nnnnnnnnnn nnnnnnnnnn acgcaacaca atttat      116
216 <210> SEQ ID NO: 10
217 <211> LENGTH: 124
218 <212> TYPE: DNA
219 <213> ORGANISM: Bacillus thuringiensis
222 <220> FEATURE:
223 <221> NAME/KEY: N_region
224 <222> LOCATION: 33 .. 74
225 <223> OTHER INFORMATION: n = a, t, g, or c
227 <400> SEQUENCE: 10
W--> 228 taatacaaca caatattaat tgtgttgtat tannnnnnnn nnnnnnnnnn nnnnnnnnnn      60
229 nnnnnnnnnn nnnnacgcaa cacaatttac gataaataaa tactttttaga cgcaacacaa      120
230 tttta      124

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/895,435A

DATE: 04/02/2003
TIME: 12:20:36

Input Set : E:\9882012999.txt
Output Set: N:\CRF4\04022003\I895435A.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:9; N Pos. 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
Seq#:9; N Pos. 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 81, 82, 83, 84, 85, 86, 87, 88
Seq#:9; N Pos. 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
Seq#:10; N Pos. 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52
Seq#:10; N Pos. 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72
Seq#:10; N Pos. 73, 74